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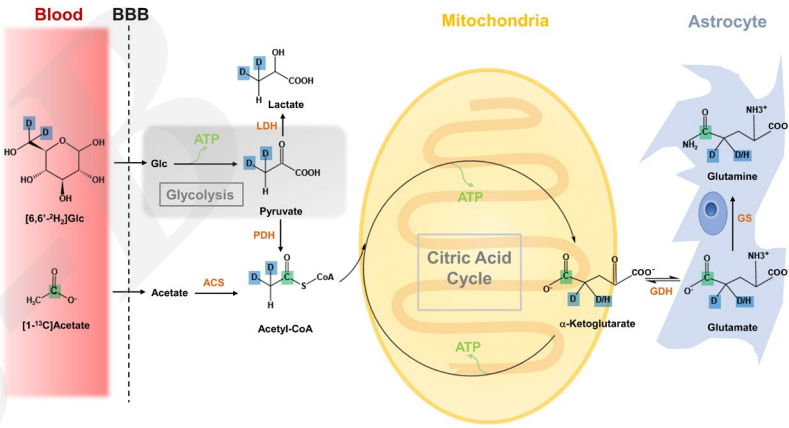
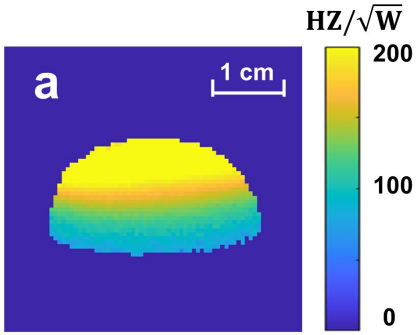
A proton birdcage coil integrated with interchangeable single loops for multi-nuclear MRI/MRS

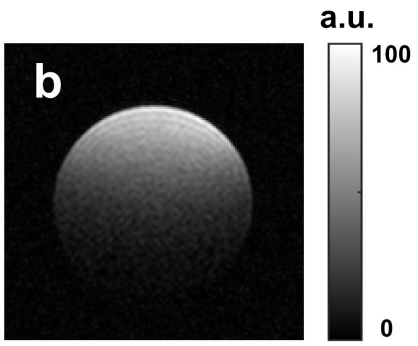
Key words: Energy metabolism, Magnetic resonance spectroscopy, Multi-nuclear, Radiofrequency coil, 3D Printing

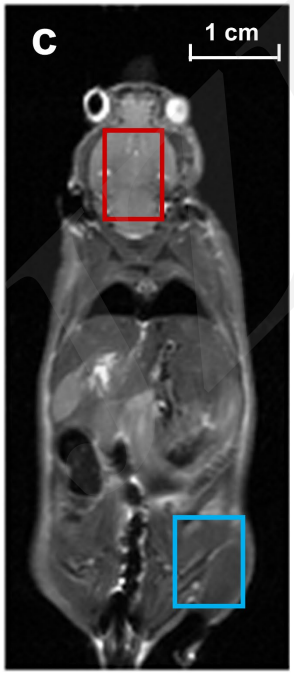
Research Summary

This study proposes a multi-nuclear coil design for structural imaging and energy metabolism detection *in vivo*:









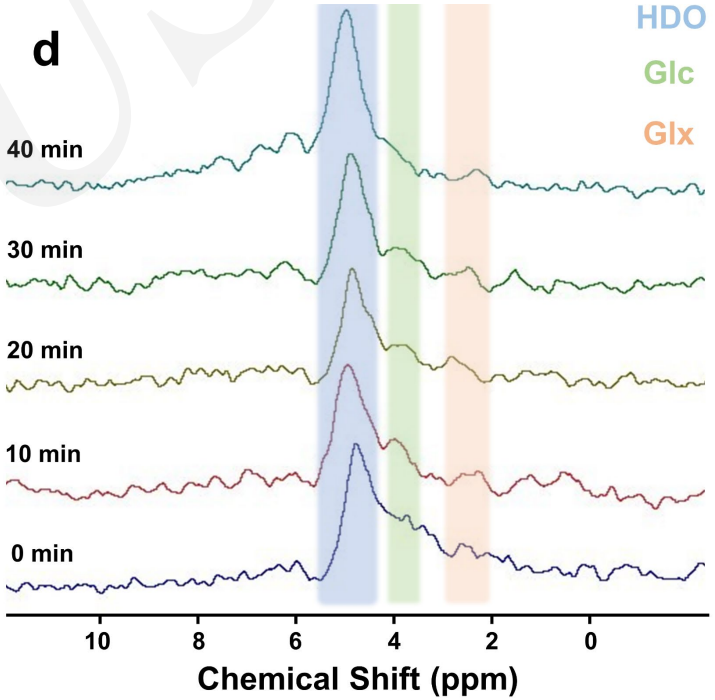
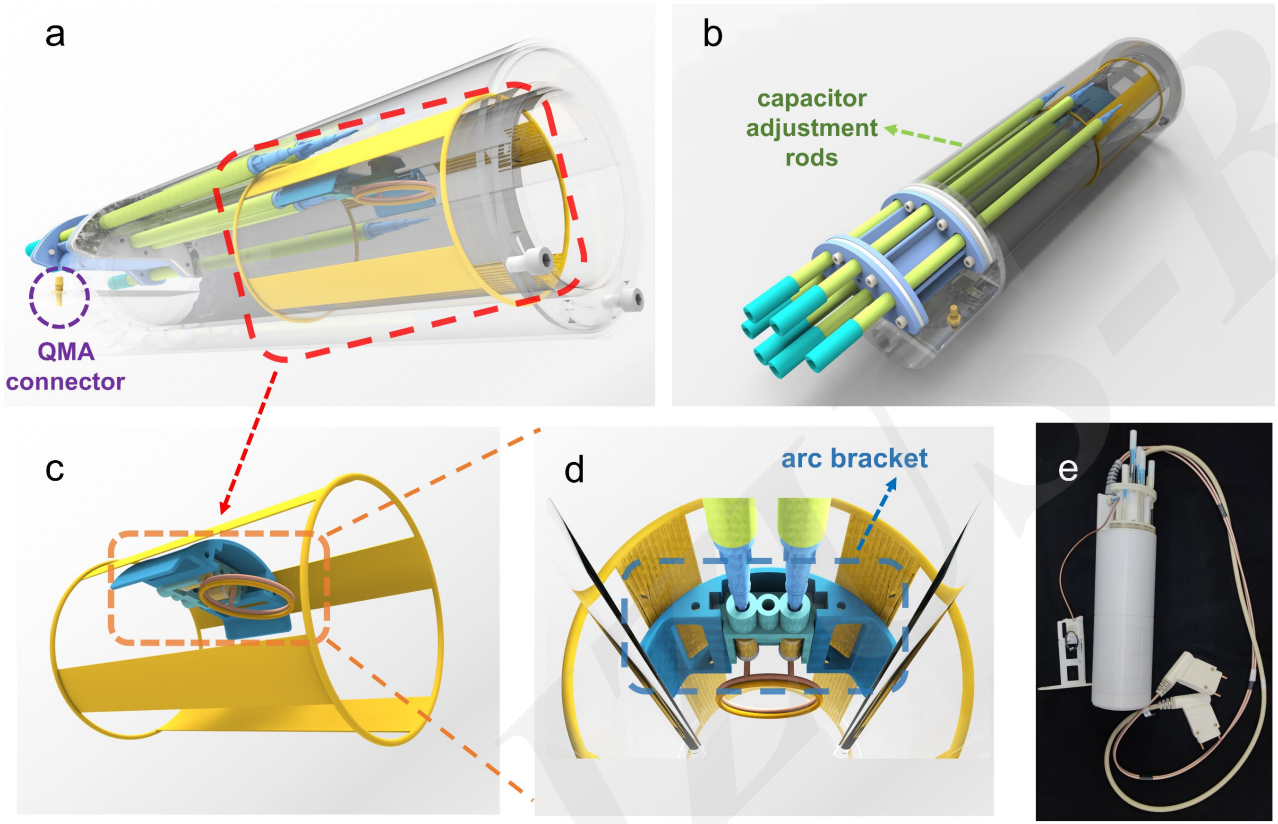


Figure 1&5

Innovation points



- **Integrated coil design for multi-nuclear MRI/MRS:**
  a birdcage proton coil with interchangeable X-nuclei single-loop coils.

- **Birdcage coil provides superior performance in structural imaging.**

- **Interchangeable single-loop coils provide convenience in coil switching and animal handling.**

Figure 4

Innovation points

This coil design could satisfy structural imaging and energy metabolism detection requirements simultaneously.

Figure 1 | Theory of Energy Detection in Vivo by MRS.

Figure 2 | Mechanical Structure of Multi-Nuclear RF TRx Coil.

Figure 3 | Performance of ^{1}H TRx Coil in Phantoms.

Figure 4 | Performance of ^{1}H TRx Coil *in vivo*.

Figure 5 | Performance of ^{2}H TRx Coil.

Figure 6 | Performance of Other X-nuclei TRx Coils